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January 25, 1994

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20054

93621

In re: ET Docket No. ~~93-63~~
Comments of The Ericsson Corporation

Dear Mr. Caton:

Transmitted herewith on behalf of The Ericsson Corporation is an original and eleven copies of its comments for filing in the above-referenced proceeding.

Should there be any questions with regard to this matter, kindly communicate directly with the undersigned.

Very truly yours,

David C. Jatlow
Counsel for The Ericsson Corporation

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List ABCDE

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	ET Docket No. 93-62
Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation	)	

To: The Commission

Comments of the Ericsson Corporation in Response to the FCC's Notice of Proposed Rule Making in ET Docket No. 93-62

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January 25, 1994

TABLE OF CONTENTS

Summary

Despite consultation with many experts in the field, Ericsson has not been able to ascertain that a condition exists which suggests harm will befall the public through the use of RF devices. Nonetheless, Ericsson supports the adoption of the proposed ANSI/IEEE Standard for RF exposure (ANSI/IEEE C95.1-1992) with certain modifications.

Because ANSI/IEEE C95.1-1992 relies more heavily on Specific Absorption Rate ("SAR") considerations than ANSI's predecessor RF exposure standard, C95.1-1982, and because the process of SAR measurement procedures is currently an immature science, Ericsson believes the FCC should designate an appropriate ANSI-accredited standards generating body to promulgate standardized measurement and calibration procedures for facilities, phantom (human) models, and antenna models to enable manufacturers and the Commission to measure with certainty that RF devices meet appropriate standards. Additionally, Ericsson believes the FCC should recognize the dynamic nature of SAR measurement techniques and adopt rules for the use of alternative methods for SAR determination such as the Finite-Difference Time-Domain computational analysis.

There is currently a trend in wireless system development towards small, low power handheld RF devices. This trend appears to be inconsistent with the C95.1-1992 rule which does not allow a categorical exclusion if the radiating structure of the device is "maintained" within 2.5 cm of the body. Because of this

inconsistency the FCC should initiate a Further Notice of Proposed Rule Making to determine if the 2.5 cm rule has continuing validity in today's wireless telecommunications market. Moreover, because today's cellular handsets appear to operate at SAR levels below those set forth in C95.1-1992 and it is likely that 2 GHz PCS will also fall below the SAR standards of C95.1-1992, the FCC should adopt a rule which allows a categorical exclusion for 2 GHz PCS devices based on power levels alone.

Base stations and mobile/portable equipment used in the Private Land Mobile Services should be subject to the controlled environment standards of C95.1-1992 due to the fact that users of such devices are fully aware of the nature of RF energy and are generally instructed in their use.

The FCC should continue to maintain a categorical exclusion for facilities operated under Parts 21, 22, 23, 90 and 94 because there has been no proof that operation of such devices is likely to cause harm.

The FCC should preempt state and local entities from imposing RF exposure standards on FCC licensees. This is necessary to prevent FCC licensees from complying with a myriad of different regulations in this regard.

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Guidelines for Evaluating	)	
the Environmental Effects	)	ET Docket No. 93-62
of Radiofrequency Radiation	)	
	)	

To: The Commission

Comments of The Ericsson Corporation

The Ericsson Corporation, on behalf of itself and affiliated and subsidiary companies (hereinafter collectively referred to as "Ericsson"), by its attorney submits its comments in ET Docket No. 93-62.[1] In support of its comments Ericsson states the following:

I. Introduction

Among other product categories, Ericsson is a manufacturer of radio base station equipment as well as portable and mobile voice and data terminals for the Private Land Mobile and Public Land Mobile services in a wide variety of frequency bands. As such, it has a history of being concerned with the potential for the harmful effects RF energy might cause to humans. Based on the power levels of terminals used in the Private Land Mobile

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[1] *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, ET Docket No. 93-62, 8 FCC Rcd 2849 (released April 8, 1993)(hereinafter referred to as the "NPRM").

Services and Public Land Mobile services at the present time, Ericsson, in consultation with many experts in the field, has not been able to ascertain that a condition exists which suggests harm will befall the public through the use of such devices. Nonetheless, due to the importance of this area, Ericsson believes the manufacturing community and the Commission should work with recognized experts to monitor the field to ensure that the telecommunications industry has the benefit of the most current thinking on this topic.

Ericsson supports the adoption of the proposed ANSI/IEEE Standard for RF exposure.[2] However, it should be noted that the NPRM increases the attention paid to Specific Absorption Rate ("SAR") considerations. While Ericsson accepts that the SAR values set forth in the proceeding have been appropriately determined by the IEEE C95.1 Committee of biomedical expert scientists ("C95.1 Committee"), it is Ericsson's position that the determination of the true SAR exposure from telecommunications products in actual use remains an immature science. Therefore, Ericsson cautions the FCC to be cognizant of the dynamics of the evolving nature of SAR measurement technology. Ericsson also recommends that certain modifications be made to the proposals in the NPRM. Specifically, Ericsson

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[2] ANSI/IEEE C95.1-1992, *Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*, approved September 26, 1991 by IEEE, published April 27, 1992 by IEEE (hereinafter referred to as the "ANSI/IEEE Standard").

recommends that:

1. The FCC should designate an appropriate ANSI-accredited standards generating body such as TIA to promulgate standardized measurement and calibration procedures for facilities, phantom (human) models, and antenna models to enable manufacturers and the Commission to measure with certainty that RF devices meet appropriate standards;

2. The FCC should recognize the dynamics and evolution of SAR determination techniques and adopt rules for the use of alternative methods such as the rapidly developing "Finite-Difference Time-Domain computational analysis"[3];

3. The FCC should adopt a further Notice of Proposed Rule Making designed to investigate whether the 2.5 cm rule of the ANSI/IEEE Standard has continuing validity for wireless telecommunications markets and/or services which are characterized by systems dimensioned specifically for lighter, smaller, low power handheld portable terminals as opposed to mobile terminals whose radiating structures are located some distance from the body;

4. The FCC should include in its rules a low power exclusion for handheld devices operating in the 2 GHz PCS spectrum[4];

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[3] See, for example, D.M. Sullivan, O.P. Gandhi and A. Taflove, "Use of the Finite-Difference Time-Domain Method in Calculating EM Absorption of Man Models," *IEEE Transactions on Biomedical Engineering, Vol. BME-35, pp. 179-186, 1988.*

[4] The C95.1 Committee is currently reviewing the question of a low power exclusion for 2 GHz PCS devices and whether the ANSI/IEEE Standard should be amended to reflect its findings. To the extent studies show 2 GHz PCS devices operate below recommended SAR levels, the C95.1 Committee will consider exclusions for spacings of less than 2.5 cm.

5. The FCC should rule that base stations as well as mobile/portable transmitters in the Private Land Mobile Services be subject to the requirements for only "controlled" environments in all situations;

6. The FCC should maintain existing categorical exclusions for Part 21, 22, 23, 90 and 94 facilities; and,

7. The FCC should preempt state and local entities from imposing inconsistent requirements in this regard on FCC licensees.

II. Discussion

A. Support For the ANSI/IEEE Standard

Ericsson agrees with the Commission that the subject of the impact of RF energy on the human body is a highly complex topic which is subject to considerable debate by scientists. Because the Commission is not an agency with biomedical research expertise in the area and should not therefore substitute its sole judgement for that of a recognized body of experts who have been working through peer review on such matters for years, Ericsson believes the Commission's proposal to adopt the ANSI/IEEE Standard, while essentially sound, should be modified in consideration of the very complex nature of the subject matter. Ericsson submits that changes to the ANSI/IEEE Standard on all but administrative or procedural matters should be referred back to the appropriate C95.1 Committee for peer review and endorsement prior to codification into the FCC's rules. Such a course of action will enable the FCC, industry and other affected parties to work with a common body of technical

information.

B. Standardized Measurements

Though Ericsson supports the Commission's proposed adoption of the ANSI/IEEE Standard, Ericsson notes, after review of C95.1-1992 and C95.3-1991[5], that there is virtually no guidance in the ANSI/IEEE Standard or the NPRM itself on how a manufacturer is to conduct measurements[6] to determine compliance with the ANSI/IEEE Standard. For low power handheld RF devices such as portable terminals used in the Private Land Mobile and Public Land Mobile services as well as those handheld devices which will be used when PCS systems are deployed, the issue has two components. The first relates to the measurement of power and the second relates to the measurement of SAR.

As to the issue of power, the ANSI/IEEE Standard provides for an exclusion for a low power device if its "radiated power" does not exceed specified levels which are dependent on the

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[5] IEEE Standard C95.3-1991, *IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields-RF and Microwave*, August 21, 1992.

[6] IEEE Standard C95.3-1991, confirms Ericsson's position. For example, Section 4.5.7 *Practical Measurement Accuracy*, notes that "...if good measurement procedures are followed, accuracies of ± 1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies, or in areas where large reflecting objects are present" (emphasis supplied). And, as noted supra., these land mobile portable radios are measured under near-field conditions. Additionally, Section 3.2.1 states that "...the calculation of near-field intensities for each situation is generally not practical due to the complex nature of near fields." Thus, while this document provides scientifically-based guidance on measurements, it does not provide the recipe for compliance with the ANSI/IEEE Standard.

frequency range in which the device operates. This is a change from the 1982 ANSI Standard[7] which based the categorical exclusion on the "input power of the radiating device." From a measurement standpoint the use of "radiated" power versus "input" power is significant. A manufacturer of a low power device can measure the "input" power to the device. It is not as easy to measure the "radiated" power since there are many variables that can affect the "radiated" power such as the space relationship of the user of the portable radio and its inherent field disturbance including possible de-tuning of the radio's RF output circuitry. Additionally, "radiated" power in the telecommunications area is classically a far-field measurement. On the other hand, at the relatively low power levels of land mobile radio transmitters, the area of interest is confined to the very near-field which is of questionable correlation to the far-field parameters that lend themselves to practical measurement. Thus, to the extent that the Commission adopts that portion of the ANSI/IEEE Standard which requires radiated power to be measured, Ericsson believes the FCC should adopt specific measurement procedures which all manufacturers can follow to make sure that radiated power is accurately ascertained.

As to the measurement of SAR, the problem becomes even more

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[7] ANSI C95.1-1982, ***American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz***, American National Standards Institute, New York, NY (hereinafter referred to as the "1982 ANSI Standard").

complicated for a variety of reasons. First, under the ANSI/IEEE Standard, SAR levels are more heavily relied upon especially due to the fact that a low power exclusion can not be used if the radiating structure of the device is maintained within 2.5 cm of the body. Second, there is currently no consensus standard in the industry or scientific community on how to conduct tests to determine compliance with SAR levels.

On the basis of actual SAR measurements of cellular handheld terminals performed for Ericsson[8] and others, considerable differences in SAR recordings have been observed. These differences are primarily related to factors such as model (phantom) construction/structure and tissue simulation assumptions. Ericsson observes that the measurement program of Dr. Om P. Gandhi incorporates a phantom which includes anatomically correct and electrically characterized tissues, organs, and structures (including bone). Ericsson submits that Dr. Gandhi's SAR determination program is one of the world's most advanced. While it might be a bit more realistic to make SAR measurements on humans, to the best of Ericsson's knowledge, no SAR tests are being conducted on humans at the present time, nor are any such tests likely in the foreseeable future. Additionally, the Gandhi program is one of the very few in the world for determining SAR under the ANSI/IEEE Standard using both

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[8] Ericsson's studies include independent, academically-based measurements conducted by an internationally recognized expert scientist in the field--Dr. Om P. Gandhi, Professor and Chairman, Department of Electrical Engineering, University of Utah.

a measured analysis of a realistic, closely simulated phantom and a mathematical analysis of a high-resolution, electrically characterized model subjected to Finite-Difference Time-Domain computational analysis.

If RF hazard rules are going to meaningfully protect the health of the growing number of people who use, or are in close proximity to those that use, low power handheld devices, it will be necessary for all manufacturers (and the Commission) to be able to (a) replicate the measurement tests on a uniform basis and (b) ensure that all devices are compliant. Since there is little guidance in the ANSI/IEEE Standard, the NPRM or within the scientific community on how to conduct tests to determine compliance, Ericsson submits the FCC should adopt uniform measurement standards and testing procedures which can be followed by the telecommunications community. These standards and testing procedures should be specific with regard to the type of equipment to be used as well as the environment under which such standards and procedures should be conducted.[9]

Having established the need for standardized testing, facilities, and calibrations, Ericsson submits the FCC should adopt a rule which specifically allows compliance to be demonstrated in accordance with other methods which, in the

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[9] The Commission has taken similar action in the past. For example, the Commission has very specific rules relating to the conduct of tests to determine compliance with the provisions of Part 15 of its rules. Similar testing rules should be adopted here.

future, prove to be more reliable from a scientific standpoint. For example, based on the rapid evolution of numerical calculations programs, the scientific community is close to devising numerical methods analysis which will offer a technique of SAR determination that is superior to, and will obviate the need for, product testing on a phantom. This alternative is particularly appealing to product designers since the use of such computer simulation techniques will enable SAR determination for products to be made and analyzed concurrent with product design, rather than measured at the end of the design process. In addition to eliminating a manufacturer's guesswork regarding SAR compliance, the use of such techniques will eliminate the need for manufacturers to invest in equipment to construct prototype devices which may or may not comply with the ANSI/IEEE Standard. This will reduce the cost to manufacture products which will be translated into lower costs for consumers.

To the extent that the Commission does not believe it has the requisite expertise or resources to promulgate such standards itself, Ericsson supports the suggestion that TIA serve as "...a focal point for the development of ...necessary standards" which could be accomplished "through its normal accredited standard setting process."[10]

C. Need For An Absolute Exclusion For Low Power Devices

As mentioned above, the ANSI/IEEE Standard provides an

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[10] See, Comments of the Telecommunications Industry Association in ET Docket No. 93-62.

exclusion for low power devices if the radiated power is less than a certain level and the radiating structure is maintained more than 2.5 cm from the body. Ericsson supports the need to protect the health of the public; supports the Commission's actions in the NPRM; and notes that the ANSI/IEEE Standard is intentionally very conservative.

Ericsson also notes that the market place is moving towards systems designed to accommodate smaller handheld devices which operate at lower radiated power levels (to allow frequency re-use) and higher frequencies (such as PCS). These trends would appear to conflict with the ANSI/IEEE Standard which does not allow use of the low power exclusion when the radiating structure of the device is maintained within 2.5 cm of the body. Therefore, Ericsson requests that the FCC ask the C95.1 Committee to develop standards which allow a low power exclusion when the radiating structure is maintained less than 2.5 cm from the body.

Ericsson recognizes that much of the discussion on the 2.5 cm issue relates to the definition of the meaning of "maintained within 2.5 cm of the body." To fully understand the definition of "maintained", Ericsson submitted a written request with the IEEE C95.1-1991 SCIV Committee asking for an interpretation of the word "maintained."[11] It is Ericsson's understanding that its request is under consideration and it will receive a response. Once the IEEE Committee has clarified the definition of

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[11] A copy of Ericsson's request is attached hereto as Appendix I.

"maintained", Ericsson submits the Commission should incorporate the definition into its rules.

Ericsson believes studies will demonstrate that low power handheld terminals in the 2 GHz PCS band will fall below the recommended SAR limits of the ANSI/IEEE Standard. However, since, to the best of Ericsson's knowledge, only limited studies have been performed for low power handheld terminals operating in the 2 GHz PCS band, and such studies are presently under the process of peer review and debate, Ericsson believes the FCC should take two actions. First, the FCC should request that an ANSI accredited standards organization of expert scientists such as the C95.1 Committee, commission a study to ascertain the requisite SAR levels for terminals in the PCS band. Second, based on the instant proceeding being the best information available today, and until the results of additional 2 GHz tests are completed and submitted to the FCC for review, the FCC should grant an exclusion[12] to all low power handheld devices in the 2 GHz PCS band that demonstrate they operate at power levels below those set forth in the ANSI/IEEE Standard.[13]

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[12] It should also be noted that in an October 11, 1993 letter to Dr. Tom Stanley, the IEEE Standards Coordinating Committee 28 on Non-Ionizing Radiation responded to specific questions of extending the low power exclusion from 1500 MHz to 2200 MHz. While the Committee could not predict what kind of extension may be incorporated into the next revision of C95.1, it does believe the extension to 2200 MHz could be "conservative."

[13] The power level would be based on the formula set out in the ANSI/IEEE Standard for low power devices operated in an uncontrolled environment, extrapolated for the frequencies at which PCS systems will operate and would also be based on the

D. RF Modulation

At paragraph 25 of the NPRM the Commission notes that guidelines adopted by the National Council on Radiation Protection and Measurements ("NCRP")[14] include a special provision on modulated carriers and recommend that stricter exposure guidelines than normal be applied to workers exposed to such fields in specified frequency bands. The Commission then invited comment on the issue insofar as the ANSI/IEEE Standard is concerned.

Despite the fact that the NCRP guidelines referred to above deal with frequencies between 3 and 100 hertz, Ericsson submits this issue has been dealt with by ANSI/IEEE. Specifically, the issue was discussed by ANSI/IEEE prior to adopting C95.1-1992 and the conclusion reached by experts is that there is no scientific data which support such claims.[15] Indeed, it can be argued that digital terminals pose less of a threat than analog terminals because new digital cellular systems with pulsed modulation have an average power less than that of older analog systems. Therefore, one can be assured that the amount of electromagnetic energy absorbed from the use of a digital terminal is correspondingly less than that absorbed from an analog terminal.

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elimination of the 2.5 cm rule for reasons set forth at pp. 10-11 herein.

[14] *Biological Effects and Exposure Criteria For Radiofrequency Electromagnetic Fields,* NCRP Report No. 86, 1986.

[15] See, also, C95.1-1992, p. 23, para. 1.

Accordingly, Ericsson asserts that the ANSI/IEEE Standard need not be re-evaluated as to this issue and the Commission need not change sound technical conclusions reached by experts in the field.

E. Private Land Mobile Devices Should Be Treated As Being In A Controlled Environment

The ANSI/IEEE Standard is different than its predecessor 1982 ANSI Standard, in part, because RF devices are considered to be located either in an "uncontrolled environment" or "controlled environment". Based on the nature of the use of base stations, handheld portables and mobile devices in the Private Land Mobile services[16], Ericsson submits that all such RF devices should be considered as being operated in a controlled environment. This distinction can logically be made due to the differences in the manner in which devices are operated pursuant to Public Land Mobile Service rules and those operated pursuant to Private Land Mobile Service rules.

In the former situation users are, for the most part, consumers who use full duplex devices as a convenience in conducting their day to day activities. Some consumers may not even be aware that RF energy is being intentionally emitted when

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[16] When the FCC adopts final rules to implement the provisions of The Omnibus Budget Reconciliation Act of 1993 which amended Sections 3(n) and 332 of the Communications Act of 1934, as amended, and creates a regulatory distinction between "commercial mobile radio service providers" and "private land mobile radio services", devices used in the class of mobile services designated as "private" should be subject to the "controlled" environment standards.

cellular telephones, for example, are in use. In the latter situation, users are generally not consumers who are unaware that devices being used emit RF power. Rather, this class of user generally uses a push-to-talk device as an integral part of his or her job and associates the push-to-talk act with transmitting the message. As such, employers generally provide detailed instruction to employees on how the radios work and how to use the radios.

Because of the heightened awareness that users in the Private Land Mobile community have of radios and their operational and physical characteristics, Ericsson submits that such devices should be treated as being in controlled environments. Out of an abundance of caution to ensure that end users are aware of the fact that radiofrequency energy is being intentionally emitted when such devices are used, Ericsson does not object to a Commission rule requiring manufacturers to include in their packaging and/or instructional material, information which clearly advises the purchaser that RF energy is being emitted by the devices in question.

F. Grandfathering

Ericsson submits that it would be virtually impossible for the Commission to issue a general recall of low power handheld portable devices which comply with the existing 1982 ANSI Standard but which may not comply with the ANSI/IEEE Standard proposed in the instant proceeding. Therefore, Ericsson submits the FCC should grandfather any device which has been type

accepted or manufactured prior to a future date certain. The future date for compliance with the new ANSI/IEEE Standard should be two years after the FCC adopts (1) a definitive SAR measurement standard or (2) an equivalent standardized numerical analysis technique, whichever comes first. Subsequent to this date applicants for equipment authorization should be required to affirm that (1) either the product for which the equipment authorization is sought is excluded from the ANSI/IEEE Standard due to its power, frequency and/or operational characteristics or (2) the product has been appropriately tested or analyzed for SAR and found to be within the ANSI/IEEE Standard limits.

G. Categorical Exclusions

In 1987, the Commission categorically excluded certain Commission-regulated facilities and services from routine evaluation of their potential adverse effect on the environment stemming from radiofrequency radiation.[17] The 1987 Order specifically provided a categorical exclusion for facilities and services in the Domestic Public Fixed Radio Service, the Public Mobile Service (which includes cellular and common carrier paging), the International Fixed Public Radiocommunications Service, the Private Land Mobile Radio Service, and the Private

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[17] *In the Matter of Responsibility of the Federal Communications Commission to Consider Biological Effects of Radiofrequency Radiation When Authorizing the Use of Radiofrequency Devices* and *Potential Effects of a Reduction in the Allowable Level of Radiofrequency Radiation on FCC Authorized Communications Services and Equipment*, Gen. Docket No. 79-144, 62 RR 2d 1086 (released April 9, 1987)(hereinafter referred to as "1987 Order").

Operational Fixed Microwave Service. The basis of the categorical exclusion was proof satisfactory to the Commission that in situations of normal use, exposure to humans in excess of established RF exposure guidelines was not likely to occur:

> ... data submitted by other respondents are persuasive in showing that excessive exposure is unlikely. Therefore, until such time as contradictory evidence is brought to our attention, we are adopting our original proposal to exclude these types of transmitting facilities from routine environmental evaluation with respect to RF radiation. Accordingly, applicants for facilities licensed under Parts 21, 22, 23, 90, 94 and other appropriate Parts of the FCC's rules are not required to routinely submit environmental information concerning exposure to RF radiation.[18]

The NPRM questions whether or not the current categorical exclusions are consistent with the provisions of the new ANSI/IEEE Standard. Except as noted above relative to the discussion of low power handheld terminals, the facilities which were categorically excluded from the submission of information regarding exposure to RF radiation, are generally not located in areas in which the general public is located. Indeed, most base stations are far away from areas in which employees of companies operating such facilities might be located except for providing maintenance on such facilities. Thus, because most experts agree that the ANSI/IEEE Standard is very conservative and because there has been no demonstration that there is likely to be harm to humans due to RF exposure from such facilities, Ericsson

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[18] 1987 Order, at para. 16.

submits that the categorical exclusion previously provided for facilities licensed under Parts 21, 22, 23, 90 and 94 should be continued.

H. Preemption of State and Local Regulations

Many state, municipal and local jurisdictions have enacted or have pending, legislation relating to the regulation of RF devices.[19] The requirement for RF products to meet numerous state, municipal, and local regulations is not in the public interest and only serves to needlessly inflate the cost of radio communications equipment. Furthermore, Ericsson believes that in view of the complex nature of RF energy interaction on the human body, all rules on this issue should be submitted to one expert source--i.e., the appropriate IEEE C95.1 Committee for peer review and endorsement. Regulations should be reviewed by a recognized body of competent experts who are skilled in the art of electromagnetic energy exposure technology and should not be left to the speculation of local leaders or other municipal groups which can not reasonably be expected to have the requisite knowledge to make effective decisions on such matters.

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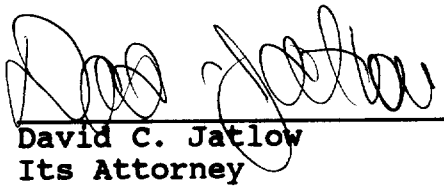
[19] For example, in the state of New Jersey, the Department of Environmental Protection and Energy, has proposed a new rule that would require registration fees and annual renewal fees for fixed non-ionizing radiation producing sources. These sources include land mobile and cellular base stations. See, N.J.A.C. 7:28-48.

Therefore, Ericsson requests that the Commission's rules and regulations specifically preempt state or local regulations in this regard.

Respectfully submitted

The Ericsson Corporation



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January 25, 1994

Appendix I

October 15, 1993 Letter From Ericsson GE Mobile Communications, Inc. to IEEE Standards Board

ERICSSON

October 15, 1993

Secretary, IEEE Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
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Re: IEEE C95.1-1991 SCIV
Request for Interpretation

Dear Secretary,

IEEE C95.1-1991 provides recommendations to prevent harmful effects in human beings exposed to electromagnetic fields in the frequency range from 3 kHz to 300 GHz. This issue is also being considered by the Federal Communications Commission for evaluating the environmental effects of radiofrequency (RF) radiation from FCC regulated facilities.[1] As the FCC proposes to adopt the IEEE C95.1-1991 standard, we are seeking an interpretation of a portion of the standard as it relates to specific applications.

Specifically, Ericsson GE requests that the technical committee respond to the following:

I. The C.95.1-1991 standard refers to "radiated power" in defining the exclusions for low power devices.[2] "Radiated power output" is defined in the IEEE dictionary as:

> The average power output available at the antenna terminals, less the losses of the antenna, for any combination of signals transmitted when averaged over the longest repetitive modulation cycle.[3]

Is our assumption correct that the IEEE dictionary definition applies? As used in C95.1 is "radiated power" intended as a measured determination or as a calculated value?

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[1] See Notice of Proposed Rulemaking, ET Docket No. 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, released April 8, 1993.

[2] For example, in the Controlled Environment "at frequencies between 100 KHz and 450 MHz, the MPE may be exceeded if the radiated power is 7 watts or less" and "at frequencies between 450 and 1 500 MHz, the MPE may be exceeded if the radiated power is 7(450/f)W or less where f is the frequency in MHz."

[3] See The New IEEE Standard Dictionary of Electrical and Electronics Terms, Fifth Edition, at p. 1056.

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